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How to submit articles

The policy of the material we can publish in Dragon User each month will be every good extent depend on the quality of the documents that you can make with your Dragon. The Dragon computer was finished in 1981 in the market with a powerful version of BASIC, but it was very poor documentation.

Articles which are submitted to Dragon User for publication should not be more than 2000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should wherever possible be computer printed on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program to please keep a copy. If you want to have your program returned you must include a stamped addressed envelope.

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Editorial

UNBELIEVABLE THOUGH IT SEEMS, the future of the Dragon computer now depends, in no small part, on a Spanish TV company.

Barhead, the Spanish company which took over manufacture of the Dragon from the now defunct Dragon Data, hopes to emulate Acorn by having the Dragon adopted by Spanish TV as their equivalent of the BBC micro.

Barhead has not been slow to recognize the benefits which have accrued to Acorn from its lucrative association with the BBC. Quite apart from the publicity value, there are considerable advantages in having 'official' backing. In addition, a TV tie-in could help open up the educational market — and regional education authority in Spain has already pledged for the Dragon.

This is not to say that Barhead's success in Spain is solely dependent on a TV contract. But, with companies such as Sinclair and Commodore making determined efforts to increase their penetration in European markets, a TV link-up would certainly help.

As far as the UK is concerned, it is obviously important that Barhead secures its home market, since this will allow the company to devote more of its attention to the existing Dragon User base in this country. A firm of new software and machines will, in turn, help persuade UK retailers that the Dragon is not 'dead' just sleeping.

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COLLEGE

Ket rises to new summit

INCENTIVE SOFTWARE is continuing its highly acclaimed adventure series the Ket Trilogy in the Dragon

OS9 accounts package

COMPUSERSE PLANS to release an integrated OS9 accounts package in the next two to three weeks. It will cost approximately £200 and will be available for the Dragon and other OS9 machines such as the Tandy colour computer.

A Plus version of the accounts package is also planned but it will not be ready for another two months, according to Managing Director Ted Croydall.

More information from Compuserse at 39600 George Lane, Palmers Green, London, N13 3XA.

Go North young man

NORTHERN DRAGON users will have the opportunity to see some of the latest software and peripherals at the Public Microcomputer show on Saturday March 16. The show, organised by Northern Premier Exhibitions, will cater for a range of machines including Dragon, Amstrad, Commodore and Sinclair.

Admission costs £1 for adults and 50p for children. The show will be held at the Civic Hall, Dawson's Corner, Putney, West Yorkshire from 10 am to 5 pm.

The series is being created from the Spectrum by John Martin and should be available in March.

Mountains of Ket Temple of Vain and The Final Mission — the three games which make up the Ket Trilogy — were launched in 1984 with a £400 video recorder stealing the first person to completely solve each adventure. Soup for Dragon owners: incentive believe that a winner will probably be announced before Dragon versions of the game are released.

The impetus behind Incentive's decision to convert the Ket Trilogy to the Dragon com-



puter from the company's initial success with Black Track. The program, which was launched in September, has already sold over one thousand copies.

The Ket Trilogy is likely to cost about £110 and will only be available by a three pack — the adventures will not be available separately. For a full review of the Ket Trilogy see our sister publication Micro-Adventurer September 1984.

Spiderman follows Hulk

SPIDERMAN IS Here. Marvel Comics' famed super hero has been brought to the Dragon courtesy of Scott Adams' Adventure International.

The game, which costs



£7.95, is a text-only adventure and features some of Spiderman's old foes such as Hydro-Man and Lizard-Man. The aim of the game is to collect a

number of gems and thus satisfy the devil doctor that you are worthy to go battle with an insatiable enemy who will appear in a later adventure.

Adventure International has also announced that all its earlier adventures will also appear on the Dragon during January. This covers Scott Adams' adventures 1-13 and the previous Quasimodo adventure — The Hulk.

Those people who find adventures difficult to solve



Exit Edna

CABLE SOFTWARE has with drawn one of its latest games, *Exit Edna*, due to technical problems. However, the company's new offer could add some to its Dragon range. *Fun may Fight* and *Home Boys* are still available at £5.95 each.

Repeat performance

THE SECOND 8000 Colour Show for Dragon and Tandy users will take place on March 30 and 31. The show will be held at London's Royal Horse Cultural Centre and admission will cost £2 for adults, £1 for children.

For further details contact the show organisers, Computer Marketing (Birmingham) Ltd, 29 Orange Street, London (Tel: 01-693 1812).

Fruit machine

FRUITY is a high resolution text module simulation recently released by London-based Impact.

The game, which was originally sold by Dragon Data under a licensing agreement, costs £4.95 and features slots, nudges and gambles wins.

Copies of the game are available from order form 15, post: 144 Station Hill, London SW12 6DU.

Channel 8 in new ice age



CHANNEL 8 Software is releasing three new adventures for the Dragon — *Midwinter*, *After the Fire* and *Beyond the Iceberg* — in its Mysterious Adventure series. Each game costs £5.95 and should be launched in February.

Norman Pearson of Channel 8 explained that *Midwinter* is set in a modern ice age. The main protagonists have just 12 days in which to find a device to melt the ice, otherwise the world will be locked in ice forever.

After the Fire is set in the

aftermath of a nuclear holocaust while *Beyond the Iceberg* takes place in a universe so far distant that the normal laws of time and physics are suspended.

All three games have been developed on what Norman Pearson calls 'smart tapes'. These tapes will work on both the 32 and 64, but the graphics data will only be loaded on a 64. Thus, if you have a 32, the adventure will be text-only, but if you upgrade to a 64 you will have the benefit of graphics as well.





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Telepath

Program: Telepath. Simp Software, 171 Midston Road, Colchester Essex. Price: £7.95

What if you had to take command of a ship with telepaths? This answer comes in the form of a soloist/duell CDP (later called Telepath). The program starts by asking for your name and then goes through a rather long title sequence, all printed in letters and upper case on the home screen.



You are next asked if you would like to start audio file (org [off] telepathic) with

graphics demonstration. Pressing "Y" returns a prompt to turn down the tape, which you play while the computer goes through a very nice graphics course. The audio history consists of a man speaking against a background of binary speechifier noise and still exactly same prototype, but quite interesting at the same.

Finally the program comes to the CDP test itself. The proved to be rather disappointingly dull involving seemingly endless repetitions - which could am I thinking of? questions to which the user presses one of the keys 1-5, the tests consist of groups of 10 questions, and at the end of each group the program prints the number of correct guesses in that group as well as your running total. The user may then continue with the test, start again, lengthen or shorten the test duration, and do a variety of other things including quit.

As there are five cards to choose from, and 20 questions per group the program points out that if guesses at random, a non-telepath could expect to score two per group - I scored four.

David Rowlands



Katopillar

Program: Katopillar 2. Micro Media, 48 Troys Road, St Austell Cornwall. Price: £5.95

KATOPILLAR is an arcade type game for which you will need joystick to play. It is written in machine code and operates on the high resolution colour mode of MACROS. This gives a range of colours which it uses to give some variety to the display. The program is obviously well designed as the game runs at an entertaining speed and has subtle responses as well as joystick responses are good.

The basic idea is that the player controls the direction in which the laser gun points with the joystick and hits the gun with the button. Suitable space-invasion-type rooms are emitted when the gun is fired

at a variety of rooms whereby to determine the player(s) suitable bonus effects are produced.

The game can stop by playing two players if a pair of joysticks are plugged into the computer. Among the attacking insects are Tasmanian Scorpions and Bees, not to



mention the Katopillar is full of course.

To complicate matters the screen is also covered with mushrooms which influence the behaviour of the Katopillar. Some of the mushrooms are "image" ones and others may be "killer" types. These have drastic effects upon the caterpillar which makes the game a lot more interesting.

As you get more expert at

the game and progress to the next level, things get steadily more difficult and faster, eventually becoming impossible. This title has been voted a great hit in my house by all ages and definitely gives good value for a high-speed arcade-type game.

Let us play!



Time Police

Program: Time Attack. Tutor Software, 15, Sunninghill Road, London West. Price: £9.95

THIS IS one of those programs that is hard to categorise. It tries to be a game and an educational program, but fails on both counts.

The object of the game part is to destroy the evil Time Police and their computer. The player is first presented with a timing control panel. A little experimental on events that the "up arrow" and "down arrow" keys move the ship forward and backward through time and "E" places the player outside the ship. If the latter is selected the score panel shows a low res picture of the timepothole surroundings at the particular year you have arrived at. This usually consists of a group of buildings which, although colourful

doesn't differ much from year to year.

Once outside, providing the player isn't awarded a shot at there are three courses of action he or she can take. If there is an old timepothole lying around, any remaining fuel can be transferred to the player's ship. If the Time Police Computer happens to be out side the ship, player can shoot it up. If all else fails, pressing "E" takes you back into the time ship to try another year.

The educational part of the program comes in the form of the "Mind Probe". This tedious Time Police weapon asks you history questions, another thought you if you get them wrong. A lot of effort has obviously gone into this program, the use of which seemed to be to bring history to life, but it doesn't really succeed and the overall effect is not up to scratch.

David Rowlands



Snow Queen

Program: Snow Queen. Cambridge Cartographics, 15, Devereux Close, Prentiss, Devon LL18 7TT. Price: £5.95

HERE IS yet another supposedly educational type of game in which the player has to find the letters of a word presented in a confusing mass of black and white squares. The letters to be found are formed using the corner squares of the five skeleton forms of Dragon Basic.

A blue coloured rectangle must be placed over the required letter using either a combination of numbers and cursor arrow keys to find the rectangle to its next position or

a joystick to serve the same purpose. This has to be done against the clock and a score is accumulated as the player proceeds through the different words set. The length of words



all can be varied according to the level of difficulty required.

The problems are "solved" by the *Shove Queen*, whom the player pleases by obtaining the correct answer. The successful player is rewarded by marks, and a rather tedious display attempting to obtain a prize crystal.

It appears to me that this program was written for a less sophisticated than the *Dragon*, as it does not make use of its graphics capabilities in any way. Although the program has been written in Basic, it expects the tedious drawing of the *Shove Queen* machine using the LINE command. Much better crystals could

have been formed using the GRAPH command and then storing them with GET and recalling them with PUT. This would have been much better, but would not have overruled the fundamental problem of this program in that the letters to be identified are very difficult to recognize because some of them resemble H, R, W and M and are very odd. My children (ages six, nine and 11) soon gave up on this game.

To summarize: therefore not a bad idea, but poorly written and of little appeal to children (mine anyway).

—*Jim de Geynes*



Pogo Stick

Program: PO GO-JO J Morrison Maccs 4 Run Gardens Tisbury Wiltshire W3 1JF Price: £3.95

MORE AND more Cubert clones are appearing for the *Dragon* these days — "Blockhead" from Touchmaster and

"Cubert" from Tarn. Mine is named "Pogo". The latest is from J Morrison Maccs.

In case anyone hasn't seen a version of this game, the

colourful, but the graphics are limited to cubes and springs. At least there is a black background which makes a nice change to the usual green that 99 per cent of software seems to use.

Having taken all the game goes into its game rules which shows all 18 different screens (different arrangements of cubert whilst playing a pogo stick). You are allowed to start at any of the 18 screens on any level (1-4). The level simply determines how many enemy springs will come over the screen — as

Dungeon

Program: Dungeon Raid Microdeal 45 Turn Road 35 Appleton, Cornwall PR20 3JH

DUNGEON RAID is an example of an arcade adventure game — a type that has grown to be more popular recently. As such it combines the excitement aspects of an adventure game with the quick fire-guns usually necessary to avoid them.

This game starts off by allowing you to choose the background colour and the difficulty level from 1 to 3. You control a small figure who appears to run down a long corridor containing dangerous rooms. The floor is achieved by keeping the figure still and activating the walls up the screen past him.

There is only a limited amount of time to pass through each room, and you must not touch any of the walls. In each room are snakes, bats and snappers that you must avoid by use of the joystick. These can be shot by pressing the fire button which releases a blast

downwards. This is also the way in which you compare the scores between each room.

To provide some extra interest, disabling the labyrinthian doors which lock and the player with figure 8. You shoot these by making you lose a reserve mark (I have seen any left). Each time you destroy one of the enemies, a type of shock wave bounces



out in both side walls and back, which is probably major of a problem to avoid than the one-lives (I suspect).

—*John Screen*



Yumping Yack Flash

Program: Yumping Yack Flash Software 33A High Street Epsom Cleveland T88 5JD Price: £5.95

YET ANOTHER *Donkey Kong* arcade game derivative, but with a difference. It is written in machine code and the quality of the graphics and sound are good. All the situations you need to play the game are included with the program and you can choose to have them shown or not.

The basic idea of this "Yumper" has to jump from one platform to another in a series of rooms, to get a key which is needed to open a door on the other side of the room and a number of jumps away. Just to make things interesting, a variety of monsters wander about and unless you are careful, Yumper will be either crushed by a monster (break his head on the roof) or crushed by a falling box (as far as I know).

The movements can be controlled either by joystick or from the keyboard. All room results are accompanied by

good sound effects giving quite an enjoyable game. With experience one can learn to anticipate the movement of the monsters and after several games you progress to new rooms with different patterns to tackle and learn monsters to avoid. All this is set against the clock. The less time you take the higher your score. A very enjoyable game which appeared to all ages in our house.

The only drawback to this program is that exactly the same pattern of situations occur each time the program is run and the replaying seems to move in a preset pattern. With some experience therefore, you do learn how to get the better of each part of the game. Even so it will take a long time to run out of all the rooms and monsters available as each pattern is significantly different from the others. Overall therefore this is a good game.

—*John de Geynes*



object is to guide an object, in this case a shiny spring, over a 3D display of puffed Cubert. Landing on one changes its colour and changing the colour of all the cubert takes you on to the next level. Falling off the edge or being landed on by one of the enemies loses a life.

PO GO-JO is a particularly nice version as it makes excellent use of semi-graphics 3D mode. This allows full 3D and 64 x 192 graphics on all eight colours to be used at 40fps. The display is therefore very

smooth, as not intelligent it is not difficult to avoid them as you a little care.

As usual with Morrison games now, there is a hint of a hint, and an opportunity to enter your name at the start of the game. There is little to choose between various versions of the Cubert game (but as PO GO-JO is only £3.95, it would seem the best value for money).

—*Brian Gudge*



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Dumping on the Epson

Alan Wragley shows you how to print out high-resolution graphics on an Epson

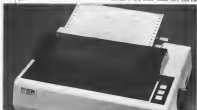
TH80 is a program for the Dragon 32 which enables a picture drawn on the high-resolution screen to be printed on an Epson printer in either single or double density mode. The whole screen can be dumped to the printer with a single key press, or alternatively a rectangle of any shape and size can be defined on the screen and then printed. This latter feature enables you to design logos or alternative typewriters for letter headings, for example.

USE A CURSOR In the top left hand corner of the address. If you want to dump the whole screen simply press **W** and skip the rest of this paragraph. If you want to select part of the screen you should move the cursor around with the arrow keys. You must define your rectangle at the top left, top right and bottom left corners. To do this place the cursor over the top left and press **1**, over the top right and press **4** and over the bottom left and press **3**. These can be defined in any order. Below are three

When you are satisfied that all three pointers have been correctly defined, press the **Clear** key. The screen will now ask you to choose between single- or double-density (press 1 or 2). As soon as you have done so, the information will be fed to the printer. The remainder of the program translates the data in the screen memory, which is arranged horizontally, into the data requested by the printer, which must be arranged vertically: eight rows at a time.

Locating IPED to IPED requires opening the source codes which are sent to the printer. The printer is then instructed with ESC: *of* address, to print previous control codes. If therefore, you want to send any control codes before the codes for example to make a new line, you must specify the new characters by placing ESC: *nn* (where *nn* is the decimal value of the character) before the codes. The next example shows ESC: A (to go to the printer to get 14th inch line spacing) which answers that each row is printed immediately below the previous one.

All the plant-off plants have the prefix 0100 with ESC = which sets the biimage mode and three further bytes to specify the density and the number of bits in the line. The contents of these three bytes are regulated automatically by the operator. ■



Programs written in Basic can take several minutes to dump an entire screen, so this one is written entirely in machine code. It occupies 421 bytes, is 14488 between locations 30347 (7000 hex) and 30767 (766F hex). It is fully directly mode, all-entire high resolution (that is P40004) screen is printed in 32 seconds or 45 minutes, in double-otherwise mode.

The program can be entered using the hex loader program in figure 1, either linked it can be saved as a machine-code program in the normal way, that is:

```
OS/2EM PRONAME: 32047 32047 32047
```

within	0.4122	0.00	0.00	0.000
space to	0.3428	0.00	0.16	0.045
concept	0.3428	0.00	0.00	0.000
The use	0.3428	0.12	0.16	0.000
within the	0.3421	0.00	0.00	0.000
your post	0.3413	0.00	0.00	0.000
their fee	0.3405	0.00	0.00	0.000
from each	0.3405	0.00	0.00	0.000
percentage	0.3403	0.00	0.00	0.000
within an	0.3399	0.12	0.16	0.000
kind of	0.3393	0.00	0.00	0.000
the group	0.3385	0.00	0.00	0.000
the post	0.3385	0.00	0.00	0.000

less-top pointers are on the same horizontal line of the screen, as otherwise you will probably just point. Moving the cursor up or down after a while takes an age to be squared if so you can press the Shift key together with the up or down arrow key.

	7120	7121	7122	7123	7124	7125	7126	7127	7128	7129	7130	7131	7132	7133	7134	7135	7136	7137	7138	7139	7140	7141	7142	7143	7144	7145	7146	7147	7148	7149	7150	7151	7152	7153	7154	7155	7156	7157	7158	7159	7160	7161	7162	7163	7164	7165	7166	7167	7168	7169	7170	7171	7172	7173	7174	7175	7176	7177	7178	7179	7180	7181	7182	7183	7184	7185	7186	7187	7188	7189	7190	7191	7192	7193	7194	7195	7196	7197	7198	7199	7200	7201	7202	7203	7204	7205	7206	7207	7208	7209	7210	7211	7212	7213	7214	7215	7216	7217	7218	7219	7220	7221	7222	7223	7224	7225	7226	7227	7228	7229	7230	7231	7232	7233	7234	7235	7236	7237	7238	7239	7240	7241	7242	7243	7244	7245	7246	7247	7248	7249	7250	7251	7252	7253	7254	7255	7256	7257	7258	7259	7260	7261	7262	7263	7264	7265	7266	7267	7268	7269	7270	7271	7272	7273	7274	7275	7276	7277	7278	7279	7280	7281	7282	7283	7284	7285	7286	7287	7288	7289	7290	7291	7292	7293	7294	7295	7296	7297	7298	7299	7300	7301	7302	7303	7304	7305	7306	7307	7308	7309	7310	7311	7312	7313	7314	7315	7316	7317	7318	7319	7320	7321	7322	7323	7324	7325	7326	7327	7328	7329	7330	7331	7332	7333	7334	7335	7336	7337	7338	7339	7340	7341	7342	7343	7344	7345	7346	7347	7348	7349	7350	7351	7352	7353	7354	7355	7356	7357	7358	7359	7360	7361	7362	7363	7364	7365	7366	7367	7368	7369	7370	7371	7372	7373	7374	7375	7376	7377	7378	7379	7380	7381	7382	7383	7384	7385	7386	7387	7388	7389	7390	7391	7392	7393	7394	7395	7396	7397	7398	7399	7400	7401	7402	7403	7404	7405	7406	7407	7408	7409	7410	7411	7412	7413	7414	7415	7416	7417	7418	7419	7420	7421	7422	7423	7424	7425	7426	7427	7428	7429	7430	7431	7432	7433	7434	7435	7436	7437	7438	7439	7440	7441	7442	7443	7444	7445	7446	7447	7448	7449	7450	7451	7452	7453	7454	7455	7456	7457	7458	7459	7460	7461	7462	7463	7464	7465	7466	7467	7468	7469	7470	7471	7472	7473	7474	7475	7476	7477	7478	7479	7480	7481	7482	7483	7484	7485	7486	7487	7488	7489	7490	7491	7492	7493	7494	7495	7496	7497	7498	7499	7500	7501	7502	7503	7504	7505	7506	7507	7508	7509	7510	7511	7512	7513	7514	7515	7516	7517	7518	7519	7520	7521	7522	7523	7524	7525	7526	7527	7528	7529	7530	7531	7532	7533	7534	7535	7536	7537	7538	7539	7540	7541	7542	7543	7544	7545	7546	7547	7548	7549	7550	7551	7552	7553	7554	7555	7556	7557	7558	7559	7560	7561	7562	7563	7564	7565	7566	7567	7568	7569	7570	7571	7572	7573	7574	7575	7576	7577	7578	7579	7580	7581	7582	7583	7584	7585	7586	7587	7588	7589	7590	7591	7592	7593	7594	7595	7596	7597	7598	7599	7600	7601	7602	7603	7604	7605	7606	7607	7608	7609	7610	7611	7612	7613	7614	7615	7616	7617	7618	7619	7620	7621	7622	7623	7624	7625	7626	7627	7628	7629	7630	7631	7632	7633	7634	7635	7636	7637	7638	7639	7640	7641	7642	7643	7644	7645	7646	7647	7648	7649	7650	7651	7652	7653	7654	7655	7656	7657	7658	7659	7660	7661	7662	7663	7664	7665	7666	7667	7668	7669	7670	7671	7672	7673	7674	7675	7676	7677	7678	7679	7680	7681	7682	7683	7684	7685	7686	7687	7688	7689	7690	7691	7692	7693	7694	7695	7696	7697	7698	7699	7700	7701	7702	7703	7704	7705	7706	7707	7708	7709	7710	7711	7712	7713	7714	7715	7716	7717	7718	7719	7720	7721	7722	7723	7724	7725	7726	7727	7728	7729	7730	7731	7732	7733	7734	7735	7736	7737	7738	7739	7740	7741	7742	7743	7744	7745	7746	7747	7748	7749	7750	7751	7752	7753	7754	7755	7756	7757	7758	7759	7760	7761	7762	7763	7764	7765	7766	7767	7768	7769	7770	7771	7772	7773	7774	7775	7776	7777	7778	7779	7780	7781	7782	7783	7784	7785	7786	7787	7788	7789	7790	7791	7792	7793	7794	7795	7796	7797	7798	7799	7800	7801	7802	7803	7804	7805	7806	7807	7808	7809	7810	7811	7812	7813	7814	7815	7816	7817	7818	7819	7820	7821	7822	7823	7824	7825	7826	7827	7828	7829	7830	7831	7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	7842	7843	7844	7845	7846	7847	7848	7849	7850	7851	7852	7853	7854	7855	7856	7857	7858	7859	7860	7861	7862	7863	7864	7865	7866	7867	7868	7869	7870	7871	7872	7873	7874	7875	7876	7877	7878	7879	7880	7881	7882	7883	7884	7885	7886	7887	7888	7889	7890	7891	7892	7893	7894	7895	7896	7897	7898	7899	7900	7901	7902	7903	7904	7905	7906	7907	7908	7909	7910	7911	7912	7913	7914	7915	7916	7917	7918	7919	7920	7921	7922	7923	7924	7925	7926	7927	7928	7929	7930	7931	7932	7933	7934	7935	7936	7937	7938	7939	7940	7941	7942	7943	7944	7945	7946	7947	7948	7949	7950	7951	7952	7953	7954	7955	7956	7957	7958	7959	7960	7961	7962	7963	7964	7965	7966	7967	7968	7969	7970	7971	7972	7973	7974	7975	7976	7977	7978	7979	7980	7981	7982	7983	7984	7985	7986	7987	7988	7989	7990	7991	7992	7993	7994	7995	7996	7997	7998	7999	8000
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Go Flex

Brian Cudge looks at an alternative to OS9

IF YOU ARE thinking of moving up to a professional operating system for your Dragon, then an alternative to OS-9 is Flex from Compuserve. The minimum system required is a 1MB Dragon and a disk drive (though two disk drives are preferable).

The Flex disk is supplied with a hefty 200 page manual which describes all the commands and the editor/assembly which is included on the system disk. Also included is a booklet describing a few extra features added to the standard Flex set up for the Dragon implementation. Unfortunately I have not seen a copy of the latter.

It is advisable not to use your original disk, but to immediately make a backup copy and use this to load Flex (one crash could wipe out the disk). Once installed into the disk drive Flex is started using the EXEC command. After a few seconds the screen goes into 61 column mode (using Mode 4 graphics) and asks for the current date to be typed in.

The disk supplied has a demo program installed as the startup procedure which welcomes you to Flex (the date is deleted from the disk after you've finished with the package). There is a Flex prompt to signal that it is waiting for a command. The first one is to run GAT which shows a directory of the disk — various parameters can be added to the command so that only certain types of file are listed etc. The rest of the file is also shown.

As with OS9 the BUILD command allows you to enter a file from the keyboard. The EXEC command can be used to execute this file as a set of instructions. You might for example build a file with the necessary commands to copy the disk on a hard disk or drive 2.

A powerful TTYSET command allows you to alter just about every attribute associated with your terminal as this is never anything but a Dragon running Compuserve's standard 502 column display file will seldom be used.

A certain degree of IO redirection is possible. Sending output to a file or printer rather than the screen, and taking input from a file rather than the keyboard are all supported.

The Flex Operating System is composed of three parts: the File Management System which allocates disk space; the Disk Operating System which interfaces the programs and the ROM to the Dragon disk drives; and the utility command set which are the commands such as GAT, DEL, BUILD etc. All of these are stored on the disk and are only loaded when called by the user. Flex itself is stored in ROM starting at \$C000 which just happens to be where the DragonDOS is stored on ROM.

Also included on the Flex disk as mentioned earlier is an Assembler/Editor; the editor is used to prepare text files for the assembler. It is a full text editor but as is so easy a word processor. The assembler is the program with looking at.

A file is assembled by entering the assembler called ASMM and following this by the filename of the source code. A number of options can be added to do things like generate no object code, suppress the assembly listing, suppress the symbol table output and suppress warning messages.

The assembler uses the standard Macro file memories so most assembly language programs for the Dragon can be entered with the minimum of changes. However there are some very powerful features that most Dragon assemblers do not offer. Disk files can be assembled into part of the program using the LIB directive, several conditional assembly constructions using IF are supported, such as

```
IF expression  
code  
ENDIF
```

Finally perhaps the most powerful option is to include macros into your program. Macros are similar to subroutines except that when called the code is inserted at the current location. Therefore these calls to a macro results in three copies of the same code in your program — not very efficient. Macros really become useful when you start using them with parameters — the basic construction of the code is the same each time but the memory addresses used are different and are supplied as parameters in the macro call. Using conditional assembly statements in the macro itself allows very powerful programming techniques to be used.

If you want to know more about the Flex operating system then there is an extensive programmers guide available. This is certainly not written for the beginner and none of the information included in it is needed to use Flex efficiently. But if you have written your own Flex commands or customising your system then you will find all the information here.

A memory map of all the user callables, routines is included, as well as a list of the useful locations used by Flex. There are sections on the DOS, the file management system, the disk drivers, printer driver and writing your own utility programs. Asymptotic language examples are liberally scattered throughout the text. Again the manual refers only to Flex and does not mention the Dragon or any particular implementation.

Just entered is DBASIC which allows you to use the standard Microsoft Basic in ROM with Flex. When loaded, DBASIC copies the ROM into RAM and cold starts the Basic. There are additions such as OSWAP to save a file on to a Flex disk and QLOAD to load a Basic using the EXEC command with a string instead of an address; allows you to Press a command directly to Flex such as EXEC GAT which will destroy the disk.

The possible string commands OPEN, CLOSE, INPUT, PRINT are have been extended to handle up to 8192 files at once — either sequential or random access or direct files can be specified. Channel numbers 1-8 are used.

There are also extensions to the GUS command to use the file to read in casual text screen as you effectively get CompuServe's Flex cartridge built in the string programs can be loaded and used with the exception of those that use DragonDOS commands. This package is only really intended as a cheap alternative to a complicated Basic running under Flex and to maintain compatibility with present Dragon programs.

Finally also available for Dragon Flex is the RMS database which is also available for the OS9 operating system. This record management system allows you to store just about any type of record you want (such as personnel, customer, accounting or statistics).

RMS will update the file to show file details for you and then request the information in a table style — that is you fill in a form on the screen for each record. Once this is done, you can search for and update records from the keyboard. RMS will also produce printed reports to the specification given as a file.

RMS consists of several modules to create a new database, to input and edit the file and to print the reports. All data is saved as the standard text format, so RMS files can be read by other Flex programs and languages such as C or Pascal. RMS takes some getting used to but once mastered it is a powerful record management system if not quite a database.

Inevitably Flex is going to be compared to OS9 and to be honest it comes off worst. Although a true more powerful software than OS9 as an operating system it is much less powerful. There is no multitasking available, no paging of data to convenient programs, and it often seems it is more difficult to use. Having said that the Flex system does it probably worth buying just for the Assembler included on it, as this is certainly the most powerful it have seen running on the Dragon.

For the assembler/editor Flex gets 10 out of 10 but for an operating system it would plunge for OS9.

Flex disk & software	£89.95
Advanced Programmer's guide	£11.95
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High-speed Compiler

Brian Gedge looks at the Dynafast compiler from Compuserve

IF THERE is one disadvantage of Basic, it is that it is slow compared to machine code. Of course I think more than made up for by the fact that it is easier to learn and much easier to use and debug.

The reason Basic is slow is that each command is taken one at a time and "interpreted". This interpretation takes no account of whether the command is in a loop or whether a branch has been previously executed. For example, every time a branch is made to a line, that line is searched for starting at the first line of the program. Even if the program has jumped there previously, no note of its position is made. An interpreter is therefore as clumsy as a snail.

Intermediate code

Alternatively, a language can be compiled into intermediate code before running using a Compiler. This intermediate code is really a cross between Basic and machine code. All jumps are replaced by actual machine addresses and space for variables is reserved during compilation. Of course, a compiler cannot produce code that is as efficient as a fast machine-code program. However, compiled programs can run many times faster than interpreted ones.

The latest Basic compiler to appear for the Dragon is Dynafast from Compuserve — available either on disk or on cartridge. The version reviewed here is on disk.

Dynafast is capable of compiling any working Basic program, even including the Dragoncode extensions, but it makes best use of the advanced features of a compiler when changes are necessary. The compiler offers both floating point numbers (as used by normal Basic) and integer numbers in the range -32768 to +32767. The advantages of using integers is that they only occupy two bytes per variable, whereas floating point numbers use 7 bytes. Integer variables are also accessed much faster than floating point ones, as the 16-bit capabilities of the 6809 central processing unit are used directly.

So, to get the best speeds out of your compiled programs, integer variables should be used wherever possible. For

example, in for-next loops, counters and integer arrays. Dynafast requires that all integer variables are declared at the start of the program in comment lines, together with their storage address. For example, the line

```
20 000001 J
```

tells Dynafast that the variables I and J are integers and are to be stored at addresses 000001H and 000002H. Floating point numbers are only really necessary for large numbers and scientific applications. Using SIN, LOG, and so on, and although these are supported by Dynafast, you will not gain any advantage in speed by using them.

Once you have a working Basic program that you wish to compile, all that is needed is to load Dynafast and tell it the name of the program on disk (or tape) and the name of the output file (if you want to save the compiled program), also the mode of compilation. The options available are FAST (the program is compiled at top speed), NORMAL (the program is compiled with each line displayed with a prompt), STEP (the enter key is shown after each line has been compiled), and PRINT (the output goes to the printer). Error messages and warning messages are clearly displayed during compilation and most programs compile in a matter of seconds.



The compiled program is run using EXEC, and the break key is disabled (there is an option to have the break key checked if required). All integer arithmetic is fully compiled and floating point and other special commands (for example graphics) are semi-compiled — at runtime the ROM is called directly. The compiled program is put into memory where the original Basic one was, so it has no longer to be saved. Subsequent use of ROM will run the compiled program.

lined programs for speed using Dynafast, some were (for example bench marks supplied on the disk, some were my own. The results are shown in figure 1.

Clearly the compiled programs run much faster when using integers, using floating point operations, as in BASIC offers very little time saving.

In addition to the compiler, two other programs are included on disk — Dyna-mem and Dynafast. Dynafast analyses a Basic program producing a cross reference table showing variables and constants. Once loaded you simply load your Basic program to be analysed and type EXEC. There are several options available by adding a colon and character after the exec, for example EXEC A2 will only list variables (values whose first character is between A and Z) and EXEC * will only list string variables.

Dynafast display

The display constantly shows what Dynafast is doing and once completed the program can be loaded with the variable table to either the screen or the printer. Clearly the program is of little use to the Basic programmer, but used in conjunction with the compiler it can help you to decide what variables can be changed to integer ones in existing programs.

Dynafast is intelligent by compressing Basic programs by the following methods:

1. Removing all spaces
2. Deleting unnecessary REMs
3. Combining several lines into one. This process will nearly always save you a lot of memory and will often speed up programs (although not very significantly).

When used on a program before compilation the resulting compiled program also takes less memory. It is quite to keep a copy of the original program as, compressed versions are very difficult to read however.

To summarise, Dynafast from Compuserve is a very professional package at a price and easy to use. Dynafast even has help pages for each step and the manual supplied is excellent. The disk (for tape with cartridge) also contains some test and demo programs to get you started.

The major advantage of Dynafast over its rivals is its ability to handle ALL Basic commands, even if some are only directed to the ROM. This does mean that any working program can be compiled with very little alteration. The price is not cheap, £29.95 for Cartridge or Disk, which is twice the price of the Basic compiler, but Dynafast offers more features. If you want faster programs and can't use machine code then Dynafast should be your first choice.

	Interpreter
BM1	1.46 secs
BM2	18.34
BM3	19.82
BM4	17.12
BM5	65.18
BM6	16.39

	Compiler
	secs
	2.48
	7.40
	9.74
	5.38
	64.18
	15.64

	Test
	FOR-NEXT
	Counter loop
	Integer calculation
	5000 GOSUB's
	Floating Point calcs
	Print a number (1000x)

Figure 1: The results of a speed test using Dynafast

DRAGON OPEN FILE

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Meander

From *Meander* in *Scissors*

MEANDER is a strategy board game for two players. The object of the game is to form a continuous line from the top left corner of the board to the bottom right

corner, or to force your opponent to the edge of the board.

To form the line, one of three possible pieces are placed at the end of the existing line. These pieces will cause the line to change direction and sometimes to loop over itself. The program will automatically search for the end of the line, so in order to place a piece, it is only necessary to type in its identity letter. The three pieces are permanently displayed on the side of the board for reference.

Program Notes

Lines

150-153 Draw the board

650-770 Search for the end of the line. Line 770 checks whether the next space is vacant and if it is not, causes a repeat search.

490 and 780 Check for the two different ways of ending the game.

When typing the program, all REMs may be omitted.

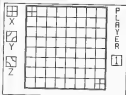


Fig. 1. The board at the start of a game.

```
10 REM MEANDER
20 REM INITIALIZATION AND TITLES
30 DIM C(0,9),Y(0,9),Z(0,9),A(9,9)
40 P1$="BXZ27,123,45678910"
50 P2$="BXZ27,123,456789102345678910"
60 CLS
70 PRINT#73,STRING$(11,"*")
80 PRINT#105,"* MEANDER *"
90 PRINT#137,STRING$(11,"*")
100 FOR I=1 TO 100:NEXT I
110 PRINT#224,"DO YOU WANT INSTRUCTIONS? (Y/N)"
120 IF I=INKEY$ IF I$="" THEN 120
130 IF I$="Y" THEN GOTO
140 REM DRAW BOARD
```

```
150 PROCDE4,1,POLS:SCREEN1,1
160 FOR Y=12 TO 112 STEP 50
170 LINE(8,Y)-(128,Y+20),PSET,8
180 NEXT Y
190 DRAW"BX14,12,310ML10WR10WD10"
200 CIRCLE(8,42),10,5,1,,5,,25
210 CIRCLE(28,82),10,5,1,,5,,75
220 CIRCLE(48,122),10,5,1,,25,,5
230 CIRCLE(68,162),10,5,1,,75,,1
240 DRAW"BX14,36,MZ2,48,BX14,48,MZ
2,36"
250 DRAW"BX14,86,M18,Y2,ND4,MZ7,86"
260 DRAW"BX14,136,RR,M14,148,RR"
270 GET(8,12)-(128,32),X,G
280 GET(8,62)-(68,82),Y,G
290 GET(8,112)-(128,132),Z,G
300 FOR S=48 TO 208 STEP 20
310 LINE(X,12)-(X,172),PSET
320 NEXT X
330 LINE(46,10)-(126,174),PSET,8
340 FOR Y=12 TO 172 STEP 20
350 LINE(48,Y)-(128,Y),PSET
360 NEXT Y
370 PUT(48,12)-(168,32),X,PSET
380 PUT(188,152)-(128,172),X,PSET
390 DRAW"BX28,22,U10R6DSL6"
400 DRAW"BX28,36,M10R6"
410 DRAW"BX28,50,USNR6ML1R610"
420 DRAW"BX31,64,USNR228,54,MZ34,
54"
430 DRAW"BX28,78,M10R6R4USR6"
440 DRAW"BX28,92,U10R6F1038NLSH2
34,92"
450 LINE(124,105)-(124,125),PSET,8
```

```

460 REM PLAY
470 FOR X=0 TO 9:FOR Y=0 TO 9:A(X,
Y)=0:NEXT Y,X
480 A(1,1)=1:A(8,8)=1:X=38:Y=22:X1
=Y:Y1=22:P=2
490 IF X1>208 OR X1<48 OR Y1>172 O
R Y1<12 THEN GOTO
500 ON P GOTO 510,520
510 DRAW"CO"+P18+"C5"+P28:P=2:GOTO
530
520 DRAW"CO"+P28+"C5"+P18:P=1
530 I8=INKEY$:IF I8="" THEN 530
540 IF I8<"1" OR I8>"2" THEN 530
550 ON ASC(I8)-67 GOTO 560,590,600
560 PUT(X1-10,Y1-10)-(X1+10,Y1+10
),X,PSET:A(1(Y1-2)/20,(X1-38)/20)=1
570 GOTO 630
580 PUT(X1-10,Y1-10)-(X1+10,Y1+10
),Y,PSET:A(1(Y1-2)/20,(X1-38)/20)=2
590 GOTO 630
600 PUT(X1-10,Y1-10)-(X1+10,Y1+10
),Z,PSET:A(1(Y1-2)/20,(X1-38)/20)=3
610 GOTO 630
620 REM SEARCH FOR END OF LINE
630 ON A(1(Y1-2)/20,(X1-38)/20) GO
TO 640,600,720
640 IF X1=X+20 THEN X=X1:Y=Y1:X1=X
+20:Y1=Y1:GOTO 760
650 IF X1=X-20 THEN X=X1:Y=Y1:X1=X
-20:Y1=Y1:GOTO 760
660 IF Y1=Y-20 THEN X=X1:Y=Y1:X1=X
:Y1=Y-20:GOTO 760
670 IF Y1=Y+20 THEN X=X1:Y=Y1:X1=X
:Y1=Y+20:GOTO 760
680 IF X1=X+20 THEN X=X1:Y=Y1:X1=X
:Y1=Y-20:GOTO 760
690 IF X1=X-20 THEN X=X1:Y=Y1:X1=X
:Y1=Y+20:GOTO 760
700 IF Y1=Y-20 THEN X=X1:Y=Y1:X1=X
+20:Y1=Y:GOTO 760
710 IF Y1=Y+20 THEN X=X1:Y=Y1:X1=X
-20:Y1=Y:GOTO 760
720 IF X1=X+20 THEN X=X1:Y=Y1:X1=X
:Y1=Y+20:GOTO 760
730 IF X1=X-20 THEN X=X1:Y=Y1:X1=X
:Y1=Y-20:GOTO 760
740 IF Y1=Y-20 THEN X=X1:Y=Y1:X1=X
-20:Y1=Y:GOTO 760
750 IF Y1=Y+20 THEN X=X1:Y=Y1:X1=X
+20:Y1=Y:GOTO 760
760 IF X1=178 AND Y1=162 THEN 790
770 IF A(1(Y1-2)/20,(X1-38)/20)=T
HEN 490 ELSE 630
780 REM END TITLES
790 FOR I=1 TO 20:SCREEN 1,0:SOUND
100,1:SCREEN 1,1:SOUND 150,1:NEXT
I
800 CLS:IF P=1 THEN PRINT$71,"PLAY
ER 1 WINS." ELSE PRINT$71,"PLAYER
2 WINS."

```

```

820 FOR I=1 TO 20:SCREEN 1,0:SOUND
100,1:SCREEN 1,1:SOUND 150,1:NEXT
I
830 CLS: IF P=1 THEN PRINT$64,"PLA
YER 1 LOSES BY GOING OFF EDGE" EL
SE PRINT$64,"PLAYER 2 LOSES BY GOIN
G OFF EDGE"
840 FOR I=1 TO 1000:NEXT I
850 PRINT$448,"PRESS SPACEBAR FOR
ANOTHER GAME."
860 I8=INKEY$: IF I8="" THEN 860
870 IF I8="" THEN 150 ELSE STOP
880 REM INSTRUCTIONS
890 CLS
900 PRINT$32," THE OBJECT OF 'HEAV
ENR' IS TO COMPLETE A CONTINUOUS
LINE FROM THE TOP LEFT CORNER OF T
HE BOARD TO THE BOTTOM RIGHT CORNER
, OR TO FORCE YOUR OPPONENT TO CA
RY THE LINE OFF THE EDGE OF THE
BOARD."
910 PRINT:PRINT" SIMPLY TYPE IN TH
E LETTER OF THE PIECE YOU WISH T
O PLAY TO CONTINUE THE LINE."
920 PRINT$451,"PRESS ANY KEY TO CO
NTINUE."
930 I8=INKEY$:IF I8="" THEN 930
940 CLS
950 PRINT:PRINT" THE FIRST PIECE W
ILL BE PLACED ON THE SECOND SQUARE
OF THE TOP LINE, SO PLACING PIECE
"Y" AS THE FIRST MOVE OF A GAME
WILL AUTOMATICALLY LOSE THE GAM
E."
960 PRINT$326," PRESS ANY KEY TO P
LAY."
970 I8=INKEY$: IF I8="" THEN 970
980 GOTO 150

```

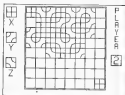


Fig. 2. A possible position after 29 moves. If Player 2 now plays piece 'X' he will lose, or if he plays piece 'Y' he is bound to win.

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£155.95, 77th £157.95, 78th £159.95, 79th £161.95, 80th £163.95, 81st £165.95, 82nd £167.95, 83rd £169.95, 84th £171.95, 85th £173.95, 86th £175.95, 87th £177.95, 88th £179.95, 89th £181.95, 90th £183.95, 91st £185.95, 92nd £187.95, 93rd £189.95, 94th £191.95, 95th £193.95, 96th £195.95, 97th £197.95, 98th £199.95, 99th £201.95, 100th £203.95, 101st £205.95, 102nd £207.95, 103rd £209.95, 104th £211.95, 105th £213.95, 106th £215.95, 107th £217.95, 108th £219.95, 109th £221.95, 110th £223.95, 111th £225.95, 112th £227.95, 113th £229.95, 114th £231.95, 115th £233.95, 116th £235.95, 117th £237.95, 118th £239.95, 119th £241.95, 120th £243.95, 121st £245.95, 122nd £247.95, 123rd £249.95, 124th £251.95, 125th £253.95, 126th £255.95, 127th £257.95, 128th £259.95, 129th £261.95, 130th £263.95, 131st £265.95, 132nd £267.95, 133rd £269.95, 134th £271.95, 135th £273.95, 136th £275.95, 137th £277.95, 138th £279.95, 139th £281.95, 140th £283.95, 141st £285.95, 142nd £287.95, 143rd £289.95, 144th 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Directory

First of February in London

THIS IS A fast-loading location program modified on M. McFadden's program published in the July 1985 issue of Dragon User.

The program stores arrays and data statements and in the listed format represents a data window which can be loaded, then listed and the data statements extended to the required contents of a particular tape. The extended program is then saved at the start of the tape, and the first program on the menu is also saved.

The tape is then reloaded, and the

directory used to locate the second program by fast forward and, after this is saved the tape is again reloaded and the directory used to locate for program 3.

The program is easily adapted to suit any size of tape, the numbers given being those found from experiments to suit a C 90 cassette divided into 11 segments to allow storage of most programs.

If a different sized tape is used the user can adapt the array size to suit the contents and extend the data lines to suit his programs.

A dummy tape run using a stop watch can help determine what value to use for the loading wait for fast forward.

Program notes

55-170 Sets up variables and for arrays.

175-220 Displays first half of menu and allows selection.

220-260 Repeats process for page 2 of the menu.

410 Caters for selection of non-existent program by error or to locate tape for saving.

420-495 Supplies prompt messages and motor waiting for tape loading.

510 Applies wait for saving.

520-560 Supplies prompts for loading program and selecting.

570-580 Data lines. The numbers are given by experiment, providing six to eight seconds of tape loading per program at fast speed. The wait should be extended as shown and then details of tapes and programs added when used.

```

5 REM *****
10 REM *** DIRECTORY ***
20 REM * WITH FAST FORWARD *
30 REM * A.PATERSON 7/84 *
40 REM *****
50 CLEAR 1000:DIM X(18),N%(18)
60 FOR M=0 TO 18:READ X(M),N%(M):
NEXT
70 CLS:PRINT$(24,STR$(M$(32,CHR$(1
72),STR$(M$(12,""),"DIRECTORY";S
TR$(M$(11,"");STR$(M$(32,CHR$(143
));
75 FOR D=1 TO 1000:NEXT:CLS
80 C$="PLEASE PRESS FAST FORWARD K
EY"
90 D$="ON THE TAPE RECORDER"
100 C$="THEN PRESS THE SPACEBAR"
110 F$="PLEASE PRESS THE PLAY BUTT
ON"
120 G$="PLEASE WAIT"
130 H$="SEARCHING FOR"
140 J$="LOADING"
150 P$="SORRY NOTHING LISTED YET"
160 C=(P$;D=198;E=232
170 CLS
180 PRINT$(M$(14,"");"MENU";S
TR$(M$(14,"");STR$(M$(32,CHR$(163);
190 PRINT$(75,"PAGE 1 OF 2"
200 FOR M=1 TO 9:PRINT "  ",N%(M),
"N%";N%(M);NEXT M
210 PRINT"PLEASE SELECT ONE OF THE
ABOVE"
220 PRINT"OR PRESS enter FOR NEXT
PAGE"
230 INPUT M$:N=VAL(N%)
250 IF N=0 THEN 300
260 IF M<1 OR M>9 THEN 270 ELSE 400
270 SOUND$(200,4):GOTO 190
300 FOR I=1000 TO 1479:POKE I,143:N
EXT
310 PRINT$(75,"PAGE 2 OF 2"
320 FOR M=10 TO 18:PRINT "  ",N%(M),
"N%";N%(M);NEXT M
330 PRINT"PLEASE SELECT ONE OF THE
ABOVE"

```

```

340 PRINT"OR PRESS enter FOR PAGE
ONE"
350 INPUT M$:N=VAL(N%)
360 IF M=0 THEN 140 ELSE 370
370 IF M<10 OR M>18 THEN 380 ELSE
400
380 SOUND$(200,4):GOTO 310
400 REM * FAST LOCATION *
410 CLS:IF N%(M)="" THEN
PRINT$(M$,PRINT$(PRESS 'C' TO CONT
INUE);PRINT"OR PRESS 'R' TO RETURN
TO MENU" ELSE GOTO 450
420 A$=INKEY$:IF A$="" THEN 420
430 IF A$="R" THEN 170
440 IF A$="C" THEN 420
450 CLS:IF M=1 THEN 560
455 PRINT$(M$, "DE," "E$
460 A$=INKEY$:IF A$="" THEN 465 E
LSE 460
465 TIMER=0:MOTOR ON
470 CLS:PRINT$(M$,
475 PRINT$(260,H$;" ",N%(M)
480 IF TIMER/50>X(M) THEN 490 EL
SE 480
490 MOTOR OFF
500 REM * LOADING *
510 CLS:IF N%(M)="" THEN
PRINT$(M$,FOR M=1 TO 1000:NEXT:P
RINT"TAPE POSITIONED FOR SAVING"
PROGRAM ";N$STOP
520 PRINT$(M$, "DE," "E$
530 A$=INKEY$:IF A$="" THEN 540 E
LSE 530
540 CLS:PRINT$(M$, " ",N%(M)
550 PRINT$(M$,
560 SCREEN 0,1:CLON$
570 DATA 0,,0,,3,,
,,10,,16,,24,,
,,32,,40,,48,,
,,56,,
580 DATA 65,,72,,8
0,,87,,94,,
,,101,,107,,114,,
,,121,,130,,

```



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Alien

From S. Attridge in *Micro*
This is a short program to draw an

alien creature of a hostile nature. It is
up to you to guess what it is.

```
5 REM*****DRAWING*****
10 PMODE3,1:SCREEN1,0:PCLS1
20 DRAW"GM=30,179,SLAC400L,140ZELU3
EUCH3UHL1HL1HL1HL1U1L1UH3U1H2U1
H1U2H1U22U1FAR1U1R1U1F1R1U1R2U1
1R4S1D3F5000L1D3G2L1L14L20401SLD10
1000L105"
30 DRAW"BM=-15,-30;E3R3F2D162L1G1L1
H1L1H1U1L1"
40 DRAW"BM=10,+1;40Z2R3F1R1D1F162L
3H3"
50 DRAW"BM=-1,+10;U5H3G1H1L10L1L1L1
10R1F1R1F1R3F161R2"
60 DRAW"BM=-1,-10;H1H1D1U1F1E1U1;BM=4
,0;H1G1D1F1E1U1"
```

```
80 PRINT(120,160),4,4
90 DRAW"BM=7,-2;02D2F161"
80 DRAW"BM=10,-1;L1H3U2E2"
90 PRINT(80,80),2,4
100 PAINT(150,50),2,4
110 DRAW"BM=0,100;C4E5F160L2E3"
120 PAINT(62,179),4,4
130 CIRCLE(83,160),5,2
140 PAINT(83,160),2,2
150 FORI=1TO500:NEXTI
160 CIRCLE(83,160),5,4
160 PAINT(83,160),4,4
170 FORI=1TO500:NEXTI
180 GOTO130
```

Stock control

from Mark Bennett in *Microcomputer*
This is a stock control utility program
which uses data files to read the information
and lists arrays where they can be edited.

and control
All instructions are included as REM
statements. The arrays can be changed
and more data added quite easily.

```
900 REM*****
910 REM***** STOCK CONTROL *****
920 REM***** BY MARK BENNETT *****
930 REM***** 12/5/1984 *****
940 REM*****
1000 REM BASIC STOCK CONTROL
1010 REM SUB1=STOCK NUMBER
1020 REM SUB11=DESCRIPTION
1030 REM CP11=SELL PRICE
1040 REM IS1=AMOUNT IN STOCK
1050 REM INC1=INDEX FOR STOCK NUMB
ER
1060 GOSUB 1300:REM INITIALISATION
1100 GOSUB 1400:REM PRINT OPTIONS(
MENU)
1130 PRINT"ENTER REQUIRED OPTION";
1140 INPUT OP
1160 IF OP=1 THEN GOSUB 1000
1170 IF OP=2 THEN GOSUB 3000
1180 IF OP=3 THEN GOSUB 4000
1190 IF OP=4 THEN END
1210 GOTO 1000
1300 REM SUBROUTINE INITIALIZATION
S
1310 READ NR
1320 DIM S(NR),D(NR),CP(NR),IS(
NR)
1330 GOSUB 1400:REM INITIALISE IND
EX
1350 GOSUB 1500:REPRINT STOCK FILE
1370 RETURN
1400 REM SUBROUTINE INITIALISE IND
EX
1410 FOR I=1 TO NR
1420 D(I)=1
1430 NEXT I
1440 RETURN
1500 REM SUBROUTINE READ STOCK FIL
E
1510 FOR I=1 TO NR
1520 READ S(I),D(I),CP(I),IS(I)
1530 READ INC(I)
1540 NEXT I
```

```
1550 RETURN
1600 REM SUBROUTINE PRINT OPTIONS(
MENU)
1610 CLS:REM CLEAR SCREEN
1620 PRINT" SAMPLE STOCK FI
LE"
1630 PRINT
1640 PRINT" 1.....DISPLAY FILE"
1650 PRINT
1660 PRINT" 2.....EDIT RECORD"
1670 PRINT
1680 PRINT" 3.....SORT FILE"
1690 PRINT
1700 PRINT" 4.....END"
1710 PRINT
1720 RETURN
1800 REM SUBROUTINE DISPLAY FILE
1810 GOSUB 1700:REM DISPLAY HEADIN
G
1820 FOR I=1 TO NR
1830 S=I(1)
1840 GOSUB 3000:REM DISPLAY RECORD
1850 NEXT I
1860 PRINT
1870 PRINT"PRESS RETURN TO CONTIN
UE"
1880 INPUT AS
1890 RETURN
1900 REM SUBROUTINE DISPLAY HEADIN
G
1910 CLS:REM CLEAR SCREEN
1920 PRINT"NUMBER DESC COST REP
IN STC
1930 RETURN
2000 REM DISPLAY A PARTICULAR RECD
RD
2010 PRINT S(1);TAB(17);D(1);TAB
(14);
2020 PRINTCP(1);TAB(17);IS(1);TAB(
13);
2030 PRINT IS(1)
2040 PRINT
2050 RETURN
```

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```

0000 REM EDIT A RECORD
0010 PRINT
0020 PRINTENTER STOCK NUMBER?
0030 INPUT N1
0040 GOSUB 10000REM FIND RECORD
0050 IF N1=1 THEN GOTO0000CHOOSE A
0060 EXIT0
0070 PRINT
0080 GOSUB 1000
0090 GOSUB 20000REM DISPLAY RECORD
0100 PRINT
0110 PRINTENTER Y/N?
0120 INPUT Y0
0130 IF LEFT(Y0,1)="" THEN RET0
0140 GOSUB 20000REM ENTER DETAILS
0150 GOTO 2010
0160 REM FIND RECORD ST
0170 N1=0
0180 FOR I=1 TO N4
0190 N1=N1+1
0200 IF N1=N1 THEN RETURN
0210 NEXT I
0220 N1=1REM NOT FOUND
0230 RETURN
0240 REM ENTER DETAILS
0250 PRINT
0260 PRINT
0270 PRINT"DESCRIPTION:"
0280 INPUT D1$
0290 PRINT"COST PRICE:"
0300 INPUT C1$
0310 PRINT"SELL PRICE:"
0320 INPUT S1$
0330 PRINT"IN STOCK?"
0340 INPUT I1$
0350 INPUT D1$
0360 RETURN
0370 RETURN
0380 RETURN
0390 RETURN
0400 RETURN
0410 RETURN
0420 RETURN
0430 RETURN
0440 RETURN
0450 RETURN
0460 RETURN
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0990 RETURN

```

TOP QUALITY DRAGON 32 PROGRAMS FROM B&H SOFTWARE

[illegible]

1. **NAME** _____
 2. **DATE** _____
 3. **TIME** _____
 4. **LOCATION** _____
 5. **REMARKS** _____
 6. **SIGNATURE** _____
 7. **DATE** _____
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 222. **DATE** _____
 223. **TIME** _____
 224. **LOCATION** _____
 225. **REMARKS** _____
 226. **SIGNATURE** _____

[illegible]

A 100% Machine Code and
200% Hi-end machine code

WILLIAM SHAW is a senior lecturer in the post-TWU degree programme for nursing, and a senior lecturer in the nursing school at the University of Birmingham. He is also a senior lecturer in the nursing school at the University of Birmingham. He is also a senior lecturer in the nursing school at the University of Birmingham. He is also a senior lecturer in the nursing school at the University of Birmingham.

[illegible]

Figure 1

Majority of people in the city group who had experienced sexual harassment felt that the city was a hostile work environment. They also stated that the city was not doing to prevent and stop the harassment and that the city was not doing to protect employees from sexual harassment. The city was not doing to protect employees from sexual harassment and that the city was not doing to protect employees from sexual harassment.

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Abstract

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MIKE GERRARDS ADVENTURE TRAIL

I WOULD like to say how much I like the advice of the adventure column, says reader David Cochrane of North Shields. Thank you David! You can write again. "But," he goes on, "what's that?" BUT?

But I would like to see a permanent Help feature.

Well, a Help feature rather depends on readers willing to ask for help and in the last month or two we don't receive too many letters. But now they're starting to come in quite regularly and we'll be happy to try and deal with both hints and help. So the readers' column will be devoted mainly to the readers, including one who's bravely submitted his own adventure and asked for constructive criticism. Would I give any other hint?

Having requested the Help column David Cochrane offers to set the ball rolling by helping any readers who are stuck in Watership's Return of the Ring, which he recently completed and which he also highly recommends. If you need help send a stamped addressed envelope to David at 115 Grey Street, North Shields. Type and Write NE20 2DG. In fact if writing to anyone send an SAE — and that includes me! Going to my local Post Office to buy vast amounts of stamps is an adventure in itself but one I prefer to avoid. It leads to things like SILVER FOOT, GRAMME WATCH and BILL DODDS!

Back to thoughts of an assistance though and a heartfelt plea from S. Harman, step of Tyler and Wier. I am currently trying to complete Dragon Dale at St Gualdry and it's driving me up the wall. I have planned the magic bath, taken the magic leather, have done what's talking friends told me but I cannot find any other solution to dip my magic ring in.

Up the wall

If anyone has successfully completed St Gualdry then they can use themselves several times for life as it seems to be one of the most puzzling adventures. Don't turn to me for help because I only got a copy of it this week. But a very nice excuse anyway. If you wish to help S. Harman then the wall he's at is being driven up at 15 Pennington, Gualdry, Washington. Type and Write NE30 0LS.

I'd like to thank Adam Allinson for my copy of St Gualdry at least I think I'd like to thank him as all five don't so far it

wonder seriously found a dream at his one session I had with the adventure. Adam is obviously a seasoned adventurer having completed Madhouse and the Minstrel, Ring of Darkness and Prison of the Ring but he has to jump in by St Gualdry where he can't stop the mother eagle taking him, and doesn't know what the whole thing and now are for. He also can't get the points off the door in Black Sanctuary so D-I-Y hints to Adam at P.O. Barbara, Heston, Trinity College, Greenbridge CB2 1TD. I completed Black Juv-



are mired in one long story, but don't keep any notes and how can I remember how I did get the beads off the door. Magic to myself, always keep notes and maps!

It Back of 31 West End Road, Swinton. Wier would like to know how to cross the water and mountains in Ring of Darkness while Steve Harris at 1081 The Midway, Gualdry, Northants NN1 1QQ offers help to anyone stuck in Madhouse and the Minstrel.

There are a couple of readers looking for help, but I can't try and for them to find out their full addresses. Keith Cleary wrote from County Tipperary, looking for help on Dragon Dale's Camoron Moor, but I can't read Keith's address clearly. Write again, Keith. And write again Lancelo Dupuis of Annecy-Sur-Seine in France. I

replied to Lancelo a long letter, but it was returned to me as his address was incorrect. Lancelo's amusing letter complained that his mail was falling to pieces. I have to admit that St Gualdry has many problems as that he can't leave the dragon have dipped his ring in, is certain place. If anyone can help Lancelo or if it will mirror what is getting in touch with a French adventurer, write to me and I'll forward the letter (or where I hear from Lancelo).

A Smith of 25 Alveston Road, Maidenhead at Boking SL6 5BB was stuck at several places in Salamander's Paradise. A Smith's friends with the Apparent and the Pl and he at one was also stuck in soon the staff. I've passed something on to the reader, Courtney of Lucy Parker of Salamander who said she was looking forward to seeing her name in print.

No hints

Salamander do offer long sheets for all their adventures and if you're feeling bored at any game then they have produced no hints, versions of two adventures. For £3 each you can have no more of Madhouse or WonderLand and Mike Cifer of Dover thought they came without covers or instructions. I don't think that matters too much and I'll be having a longer look at one of those last time. What there is a little more space.

On another topic, what chance has a reader got at mastering a Dragon adventure? Tony Madeline has written The Mary Castle, there's a very nice loading screen with a quick burst of organ like music and you begin on the bridge of a burning ship.

There are some good routines included such as the pirate map which allows at any point giving you just 12 moves to deliver yourself — this has you running around looking for gunpowder, cannons, people, anything! You should start with some of those sudden death routines. I thought Tony if you're interested contact Tony at 54 Arundell Drive, Barnaby, S. Yorks YO1 1JL.

And if you're interested in asking for or offering help I've contacted me at Dragon Gate and we'll deal with as many of the letters as space permits. Next month a look at those Salamander letters and the problems of Wigorn's Damure. ■

Bookbytes

Some books for review by Dragon time,
12-13 Little Newport Street, London
WC2E 8ND

Book: *Dragon Programs*
Author: Rick Henderson
Publisher: Duckworth
Price: £8.95

SOMETHING OLD, something new... have the old usage which might also be said in some respects to reflect this collection of 20 routines for the Dragon 32. Certainly there is variety here. Whatever your taste, programmer John Ashware provides a wide assortment of material with old favourites such as Wangsten tying chess, by goal with the newer style space invaders.

In some respects the book is a little bit general, and in trying to cover such a wide range of material parts of the individual programs tend to be a little on the spare side, an impression which is not helped by the unusual side-ways format in which the entire book is printed. This is done presumably to allow for the 80 character wide format of the language to run along the

selected when starting from code.

Minor points maybe but it is these which tend to let the book down. There are page areas full of listings and a book therefore should just have that little extra attention to detail.

Gordon Lee

Book: *A Pocket Handbook for the Dragon*

Authors: Peter Gernand and Denny Doyle

Publisher: Duckworth

Price: £2.85

WHETHER I am program ming it or nothing more, I am not forgetting a memory location character code or special POKE. I have often contemplated the idea of gathering all the useful bits from various magazines together to form a sort of Handbook.

The job has been done for me by Messrs Gernand and Doyle who have produced exactly the most useful book the Dragon programmer will ever buy. At £2.85 it would represent good value at £10.00 a bit.

Within the covers lie 90 pages of very useful information for programmers including ASCII tables, character codes (or BASIC users) formulae for Hyperbolic functions, details of the connections to the computer cassette and joystick ports, the complete 640K structure set, a comprehensive memory map and more of the same. The information is arranged in alphabetical order, is spelled out and presented clearly and attractively.

But the book does have its flaws. For every useful thing in the book another equally useful thing has been left out. For example, where are the memory addresses on the 'Pit & Gnd' or the pages, making one to get into the 14 graphics modes as tentatively described? Where are details of vectors for the random number PC/M routines or the routine to print the NUMBER in the Dragon? Where is any reference made to paying of how to POKEAR 1 after having used PMODE 0?

The book is also printed in a very strange way — it is small like a series of equally sized photocopied sheets bound together. Some of the

pages are professionally printed, some of them are stapled from a Do-It-Yourself Printer, some are even hand written for reasons known only to the authors.

But despite these faults, the book is still useful to any Dragon owner who wishes to progress further than writing "Guess the Number" and "Mines Quiz" programs and will always have a place beside my Dragon 32.

Jason Orban

Book: *Introducing Pascal*

Author: David Johns

Publisher: Granada

Price: £6.95

DOUG ALLAN is a well known author in microcomputing circles and his latest book, *Introducing Pascal*, is a very well presented Pascal tutor. As Pascal is a structured language, Allan has tried to teach it in a structured fashion and I think the approach works well.

The book starts by giving the feel of Pascal, the reasons behind its development and the basic concepts involved in the language. Later chapters go into more detail about the language, ending up with a look at Pascal's file concepts. There are several useful appendices including one about Module-2, the language derived from Pascal and one describing P Code, which is used to implement many popular Pascal compilers.

Pascal is not a language which can be learnt without trying practical exercises on a computer. Dragon owners are particularly badly served in this respect, because unless you have the C or C++ there isn't a single proper Pascal compiler on the market. However, if you have access

to an implementation somewhere and you want to learn Pascal, this is a very good book to learn from. It is written in readable style and there are lots of examples. At just under £7 a most important student's value for money — what more can I say?

David Rowland

Book: *The Dragon's Guide to Fort*

Author: David Johns

Publisher: Granada

Price: £2.85

IF YOU ask the ubiquitous man in the street to name three computer languages, they will give the standard reply: BASIC, PASCAL and FORTH. FORTH is rather different from the other languages as it has no line by line program structure, can be written instead on the build up of a vocabulary, from these (no pun intended) beginnings.

A FORTH program looks daunting to the average BASIC programmer partly because of its structure and partly because of the fact that it uses Reverse Polish notation.

Several FORTH compilers are now on the market for the Dragon (both such magazines as *Dragon* and *Dragon Fort*), and the book by David Johns, although not Dragon specific, provides a very good introduction to the language. But it is not a perfect introduction. Although most people will find it very easy and quick reading to read, others will be drawn to distraction by the "Blue Peter" approach to programming.

The text is very large (and yet the book only covers 82 pages, hmm...) and the listings are all straight printer dumps and therefore theoretically perfect.

The appendices are the most useful part of the book, containing as they do a complete FORTH dictionary, a list of the standard FORTH error messages and the obligatory ASCII character set.

This isn't strictly speaking one of the books that the FORTH beginner will have to go to before buying. I would advise any interested parties to read the first two chapters in the shop and then make their choice.

Jason Orban



length of the page, but with the majority of the program lines less than half the length, there tends to be a predominance of white paper.

Overall, if there is something that appeals to you — that from a personal point of view I always feel that, for example, little adventures in BASIC or text in from the keyboard are ever really satisfactory, probably because in trying them in you get a lot of the satisfaction and any sense of 'success' is consequently strong, it would also have been a few more programs using the custom function utility in BASIC/TIMER routine to achieve more random 'fun' elements and so avoid the same sequence being



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